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ABSTRACT

The Stanford Teacher Education Program (STEP) is a standards-based program that embeds opportunities to learn key ideas and understandings in learning to teach. This study investigated whether the teaching practice of STEP graduates reflects the STEP vision of good teaching. Participants were 10 STEP graduates from the classes of 1999 and 2000, chosen to reflect, roughly, the gender and cultural backgrounds of the larger STEP population. Data came from four sources: repeated interviews with the participants, classroom observation, unit and lesson plans, and samples of work by students. The analysis suggests that one can trace elements of the STEP vision (concern for student learning, commitment to equity, content pedagogical strategies, capacity to reflect, and commitment to change,) in STEP teachers' opportunities to learn and through STEP graduates' practices. Data also suggest that this finding is consistent across subject matters. Evidence was stronger for some elements of the STEP vision than others. In particular, evidence of concern for student learning and of use of content pedagogical strategies were apparent and frequent in STEP teachers' classrooms. An appendix contains a table of data sources. (Contains 1 table and 30 references.) (SLD)

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Looking for Learning in Practice:

Examining the Teaching Practices of STEP Graduates

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Introduction

> It would be impossible just to walk into the classroom [without teacher education because] there's so many things that you need to be doing. … How are you going to put together meaningful lessons? … You need to be prepared… You need to know your subject matter. You need to know how to organize it and pick out what the important concepts are that you want your students to learn from the class. You'd have a clear picture about what you want your students to be able to do when you get out of your class. You need to learn how to scaffold. (It's a really hard thing: if you've never heard of what scaffolding is, it probably won't occur to you.) I hear a lot of teachers talk … people [who] never went to any kind of training and when a lesson doesn't work they started blaming the students. It's really easy to do that. A lot of times it's your planning, you know, how you implement it. You can't go in there and just do it halfway. You need to be as prepared as possible to meet the needs of all your students not just one category of students. Classes are more and more heterogeneous not just by race, but by the abilities that students go in there with. You need to be able to have high expectations about all of your students. And you need to have clear goals.
>
> I don't know, I'm just thinking like there is *no way* that I would be able to teach without being trained. –Paola, STEP Class of '00

What is the value of teacher education? Just as this teacher reports, advocates of teacher education suggest that much is to be learned about the development of children, of developmental, learning, language, and cultural differences, of the nature of teaching and learning, of one's subject matter and how to represent it to learners, and of instructional design and curriculum. Some powerful evidence is emerging for the value of teacher education (Koppich 1999; Merseth 1999; Zeichner 1999; Darling-Hammond 2000; Snyder 2000; Whitford 2000), but gaps still plague researchers (Wilson, Floden, & Mundy, 2001). There is also growing consensus in the research about the nature of student learning, and about what kinds of classroom environments can enhance and support deep learning (Bransford, Brown and Cocking, 2000). A number of educators and researchers agree that children learn best when their initial

knowledge and conceptions are surfaced, challenged, and built upon; when they are supported in the development of a "deep foundation of factual knowledge" that is in turn, part of a conceptual framework that helps organize knowledge and supports connections and applications; and when they are afforded opportunities to become "metacognitive" about their learning so that they can define learning goals and monitor their progress towards attaining them (Bransford, Brown & Cocking, 2000, p. 14-18).

Research also suggests that in order to teach in these ways, teachers need to be able to develop sophisticated curriculum—activities, projects, assessments—that reflects what is known about how students learn best as well as that engages all students in disciplinarily-based activities (Lee, Bryk & Smith, 1993). To accomplish this, teachers need to know not only a great deal about their content—their subject matter—but they also need to know how to represent it to their students in ways that their students can understand (Shulman, 1986). But teachers need to know more than how students learn best and how to represent their understandings in ways that students can grasp: they also need to know how to diagnose and respond to different types of learning needs, to relate to and work with students whose backgrounds are different from their own, to connect to parents, to work with colleagues, to function within changing school demands, and to learn from their own practice so that they can grow and develop as professionals—to ultimately continue to serve their students better and better (National Commission on Teaching & America's Future, 1996). All of this work must happen within a teaching arena that is increasingly demanding and complex: the changing demographics and growing diversity of our society require greater attention to social equity and inclusion and the evolving knowledge economy simultaneously demands higher levels of learning for all citizens. In sum, these are complex skills that are not easily learned.

Indeed, teaching teachers to be able to carry out this sophisticated, diagnostic, learner-centered, discipline-rich, reflective, theory-based practice presents a significant challenge for teacher educators. If teacher education programs are to demonstrate their value, they need to show that their students can reach these outcomes not only through reflecting on their practice through the sometimes abstract settings such as their teacher education coursework, but in the classroom itself as graduates. Though the need for empirical data on teacher education graduates is clear, relatively few studies of the nature and quality of teacher education programs have yet to be conducted (Zeichner, 1999). Wilson, Floden and Mundy (2001, p. iv) also argue that such studies are particularly important to inform program design: "We need more studies that relate specific parts of teachers' preparation (subject matter, pedagogy, clinical experiences) to the effects on their teaching practices and perhaps on student achievement. Studies that compare the relative importance of specific parts of teacher preparation could be useful to those designing and revising teacher education programs." Kennedy (1996) points out that linking outcomes to particular courses and aspects of programs is an important design feature that can contribute to the reliability of studies of teacher education outcomes. Of the few studies of graduates' teaching practice have been conducted, most tend to focus upon the first year after teacher education (Grossman et al, 2000).

Over the past three years, I have attempted to trace the extent to which the design of a standards-based teacher education program—the Stanford Teacher Education Program, or STEP—embeds opportunities to learn the key ideas and understandings it identifies as important, and the extent to which graduates demonstrate evidence of developing these skills, understandings, and abilities not only in their coursework but ultimately, in the classroom as professionals. Two research questions guide this study:

- To what degree has STEP embedded opportunities to learn elements of the STEP vision in its coursework, clinical experiences, and key assignments over the STEP year?
- In what ways does STEP graduates' teaching practice reflect the STEP vision of good teaching? Are there aspects of the STEP vision that are more visible in STEP graduates' practices? Aspects of the STEP vision that are less visible?

In this paper, I argue that research is beginning to demonstrate that teachers cannot "automatically" teach in these sophisticated, professional ways nor that such teaching can be developed solely from experience in the classroom (Grossman, 1989; Kunzman, in press). In fact, some research suggests that teachers who have had experience do not learn these skills in the classroom: in a recent study of students who entered STEP with prior teaching experience, Kunzman found that these experienced teachers identified many aspects of teaching that they did not learn "on the job" such as reaching diverse learners, designing, sequencing and scaffolding complicated ideas for their students, and better understanding the backgrounds and perspectives of their own students. He further demonstrated that they felt that they had learned these things through their teacher education program in STEP.

Many recent studies of the STEP program's students and graduates suggest that the students feel well prepared to teach, and also that others regard STEP students as well prepared. For instance, a survey of STEP graduates for the years 1997-2000 provides some evidence about the feelings of preparedness of STEP teachers. The survey, which had a 70% response rate, asked students about their perceptions of preparation for more than thirty aspects of teaching that reflect the knowledge, skills, and dispositions outlined in the INTASC and California Standards for the Teaching Profession, along with reports of the graduates' teaching activities, beliefs, and

practices. The survey found that respondents felt well prepared in using instructional strategies, curriculum design, the use of a range of assessments, and responding to the needs of their learners as a "whole child" (see Eiler & Marcus, in press). The survey also indicated that graduates felt "well" prepared for teaching, and the rating was significantly higher than the ratings of a national beginning teacher sample. In addition, a study of assessments of STEP students' clinical performances suggests that STEP teachers' cooperating teachers and supervisors also felt that STEP students were proficient in organizing their subject matter for student learning and in planning instruction and designing powerful learning experiences for all students by their supervisors and cooperating teachers (Lotan & Marcus, in press).

Yet what we do not know is whether these results manifested themselves in STEP graduates' practice once they completed the program and began full-time teaching. To that end, drawing upon data from classroom observations of graduates, pre and post-observation interviews with graduates, graduates' curriculum (including daily lesson plans, key assignments and assessment tools), and student work produced in STEP graduates' classrooms, I explore the degree to which one can one trace elements of the vision of STEP into graduates' classroom teaching. Can we find evidence that STEP graduates use the strategies, approaches, perspectives, and understandings that they learned in STEP in their classroom practice?

Background

Redesign of the STEP Program

Over the past four years, the Stanford Teacher Education Program has undergone a process of significant reform. The redesign of the program focused upon four goals: to develop a coherent program organized around professional standards and a common vision of good teaching; to strengthen knowledge about how to teach challenging content to diverse learners; to

support stronger links between theory and practice; and to contribute to the reshaping of local teaching and schooling by creating powerful opportunities for student and teacher learning (Hammerness & Darling-Hammond, in press).

The STEP program traditionally had several strengths. These included the involvement of senior faculty throughout the program; an emphasis on content pedagogy and on learning to teach reflectively; and a year-long clinical experience running in parallel with coursework in the one-year credential and masters degree program. The redesign of STEP sought to build on these strengths while incorporating new efforts. These included:

- the development of a common vision and the incorporation of professional standards into course design, program assessments, and clinical work;
- the development of a sequence of core courses designed to build a professional knowledge base across several interrelated strands of work representing knowledge of learners and learning; knowledge of content and pedagogy; knowledge of language, literacy, and culture; and an understanding of educational purposes and social contexts.
- the development of structures that facilitate coordination across STEP courses and strong connections between students' coursework and clinical work.

One of the central elements of the redesigned STEP program is the development of a common vision of what good teaching looks like—what a STEP graduate should be able to do—and a common vision of the pedagogy and practice that contributes to that development. The program is designed to graduate teachers who are prepared to work with diverse learners, reflect upon their practice, and inquire systematically into questions of teaching and learning that arise in their work with students. STEP faculty also emphasize a teaching stance that is concerned with understanding and responding to student needs in the light of challenging curricular goals

rather than merely "getting through the book" or implementing teaching routines. Teaching practices are informed by research on learning, development, culture and context, and families and communities. STEP faculty hope to graduate teachers who not only practice effectively in the classroom but who also can take into account the "bigger picture" of schools and schooling; who are able to consider how what they do might be supported and reflected in school organizations and reform work more broadly. STEP faculty's mission, in sum, is to help prepare its teachers to practice state-of-the-art teaching and to be agents of change in their school communities.

In order to reflect this vision, the new curriculum includes a much stronger emphasis upon learning—a key part of the STEP vision of good teaching—including learning differences and disabilities; first and second language acquisition and development; reading and writing across the curriculum; child and adolescent development; parent and family involvement; and culture and social context (see Figure 1. STEP Curriculum, 2000-2001). Courses have been added as well in subject matter pedagogy (increased to three quarters of instruction from two), classroom management, and school reform. A new technology teaching plan was developed to ensure students' proficiency in integrating technology into the curriculum. The curriculum has also been redesigned to increase the opportunities for purposeful reflection on practice and to make connections across class work and clinical experiences. Additional practice in inquiry has also been infused into the curriculum, so that students may learn how to ask good questions about the teaching and learning in their classrooms as well as how to go about exploring those questions in fruitful ways. Finally, STEP faculty have made a commitment to increasing the diversity of the students attending STEP. Thus, over the past four years, while students of color comprised only 14% percent of the class of 1999, they were 40% percent of the class of 2000, 45% percent of the

class of 2001, and 48% percent of the class of 2002. Along with any significant programmatic and teaching reforms come important questions about the relationship between the changes and student learning. Can one trace elements of the redesigned STEP vision into opportunities to learn elements of the vision, into graduates' own reflections upon their learning, and finally, in turn, to students' classroom practices?

Figure 1. STEP Curriculum, 2000-2001

Strand	Summer	Fall	Winter	Spring
Foundations	Educating for Equity and Democracy	Adolescent Development	Principles of Learning for Teaching	School Reform *or* The Ethics of Teaching
Curriculum and Instruction	Curriculum and Instruction (C&I) (*meets in subject matter groups*)	Curriculum and Instruction (C&I)	Curriculum and Instruction (C&I)	*students can take an elective in their subject field*
Language and Literacy	The Centrality of Literacies in Teaching and Learning	Teaching and Learning in Heterogeneous Classrooms	*ESL Methodology (elective)*	Second Language Practices and Policies
Practicum and Student Teaching	Practicum *Introduction to teaching as a profession, standards, & inquiry*	Practicum *Developing learning environments; communicating with parents*	Practicum *Assessment of student work and learning*	Practicum *Meeting the needs of exceptional learners; Assessing one's own teaching*
Pedagogical Strategies	Uses of Technology	Classroom Management (*half the class*)	Classroom Management (*other half of class*)	Literacy Development for Struggling Students

Methods

Participants

Participants in this study are ten STEP graduates who vary by gender, cultural and ethnic background, subject matter, and school site. The participants, five from the class of 1999 and five from the class of 2000, were chosen to roughly reflect the gender and cultural backgrounds represented in the larger STEP student population: in the class of 2000, 40% percent of the class were students of color. 46 students were women and twelve were men. In this group (see Table

1), five participants were White, two were Asian-American, two were Latino, and one was Indian-American. I included three male participants, and seven female participants, roughly reflecting the gender make-up of approximately 25% male, 75% female STEP classes from 1999 and 2000.

I selected at least two STEP teachers from each of four subject matters, English, mathematics, science and social studies, in order to identify whether students in different Curriculum and Instruction courses are essentially learning similar things in STEP or whether there is some variation across subject matters. Finally, I selected the STEP graduates to represent a range of school sites: from those teaching in higher socio-economic districts (3 graduates), to those teaching in mixed-income and/or middle-income districts (3 graduates), to those teaching in lower-income districts (4 graduates).

Table 1. Participants

Code & Class	Gender	Race/Ethnicity	Subject Taught	School Site
Grad 1 (99) "Julie"	Female	White	Science	Low income district, private school, predominantly African-American student body
Grad 2 (99) "Brenda"	Female	White	Social Studies	More affluent district, public school; White and Asian student body
Grad 3 (99) "Daniel"	Male	Philipino	Mathematics	Low income district, public school; Diverse student body
Grad 4 (99) "Rena"	Female	Indian-American	English	Middle income district, public school; Diverse student body
Grad 5 (99) "Paula"	Female	Latina	Foreign Language	Low income district, public school; Latino student body
Grad 6 (00)	Female	Latina	Social Studies	Low income

"Janita"				district, public school; diverse student body
Grad 7 (00) "Jim"	Male	White	Mathematics	Higher income district, public school; White and Asian student body
Grad 8 (00) "Kara"	Female	Asian	English	Middle income district; public school, Diverse student body
Grad 9 (00) "Lindsey"	Female	White	English/ELD	Higher income district; public school, White and Asian student body
Grad 10 (00) "Sue"	Female	White	Science	Middle income district; public school, Diverse student body

Data sources

In order to be able to provide rich data to examine these questions about the practices of STEP graduates, I identified four sources that would proffer a depth of information about their teaching practices: interviews; classroom observations; unit and lesson plans and other curriculum artifacts; and samples of work by their students. The use of these multiple sources provides important triangulation of our data (Miles & Huberman, 1994). For instance, while interviews provide key information about graduate's own classroom practice, there are limits inherent in relying solely upon self-reported data (Kennedy, 1996). Therefore, observations of classroom practice provide important supporting data about the teaching of STEP graduates. And, to address questions about the limitations of relying upon a small set of classroom observations, I collected unit plans and other artifacts of classroom practice that provide yet additional data about how graduates plan, design and sequence instruction over longer periods of time than can be attained in a classroom observation. Data were selected to provide a window

into what could be thought of as three levels of teachers' work: 1) their particular "moves" in the classroom (Gardner, p. 174) which includes the types of questions asked; activities planned and carried out; and how they guided students; 2) the strategies that guided their actions (how they designed the particular lesson I observed, what activities they chose and why); and finally, 3) their long-term planning, which is shaped by their vision and their curricular goals--what Zumwalt (1989) has called "curricular vision."

Interviews.

Each participant was interviewed three times: once after completion of the STEP program (graduates of the class of '99 were interviewed a year after their program was completed; while graduates of the class of '00 were interviewed a month after the program was completed). This interview focused upon what graduates felt they learned in the STEP program; what they learned in specific classes, and upon their preparation for teaching in STEP. Participants were also asked to describe their classroom practices (e.g. how many times an observer might see students working in groups; how many times an observer might see students assessing their own work, and so forth).

Participants were also interviewed before and after a classroom observation was scheduled. These interviews were designed to gain a sense of context of the participants' school site, students and teaching load, as well as to develop an understanding of the curriculum being taught, the purposes and goals of the lesson and some background upon the lesson to be observed. The post-observation interview was designed to invite the participant to reflect upon his or her practices that day; to request them to identify aspects of their practice that were shaped by STEP, if possible, and to follow-up on particular themes, questions or issues that had been raised in previous interviews.

Classroom Observations.

All participants were observed for at least two classroom periods, frequently for a full day of teaching. Detailed fieldnotes were taken during the observation, using a protocol designed for this study. This protocol was based one designed for similar kinds of classroom observations in the NCREST studies of teacher education programs (see for example, Darling-Hammond, 2001). The protocol pointed observers to collect and observe for very specific interactions and gather much detail from dialogue with students, to discussions by teachers, to interactions between students. Fieldnotes were typed and transcribed following this protocol.

Artifacts.

A carefully selected set of artifacts were collected from each participant. First, all handouts, assignments, and lesson plans from the day of observation were collected. Second, each participant was asked to provide copies of the overall unit plan—from which the day I observed was a part—including outlines of daily lessons, handouts, key assignments, and assessment tools. In order to be able to determine whether this unit was typical of STEP graduate's teaching practice overall, I also asked participants to share at least one other unit plan and materials (again, daily lesson plans, handouts, key assignments and assessment tools) from some other time during their teaching year. Finally, I asked participants to share at least three examples of student work from the unit which I observed—a sample that represented at least one piece each of excellent work, proficient work, and work that still needed development.

In addition to the triangulation provided by these multiple sources of data, I also draw upon survey data of the classes of 1997, 1998, 1999, and 2000 (Eiler & Marcus, in press). Many of the questions in the survey replicate those used in an earlier study by the National Commission on Teaching and America's Future (see Darling-Hammond, 2000) and allow

comparison to a national random sample of beginning teachers. Thus, we can compare some of these data about STEP graduates' practices to data from a nationwide sample of teacher education graduates.

Analysis

I conducted an initial analysis of the interviews, lesson and unit artifacts, and my observations of the STEP graduates' classroom practices using the elements of the STEP vision as a framework. I analyzed the data for evidence of the following five elements—which are all equally part of the vision; no one aspect is meant to be more emphasized— that have been articulated as part of the STEP vision (Hammerness and Darling-Hammond, in press):

- *Concern for student learning;*
- *Content pedagogical strategies;*
- *Commitment to equity;*
- *Capacity to reflect; and*
- *Commitment to change/reform*

In order to "operationalize" these broad elements of the STEP vision, I created sub-categories for each of these six aspects of the vision that represented concrete, observable aspects of practice. Some of the sub-categories were taken from the California Standards for the Teaching Profession (CSTP standards) which are used in STEP to evaluate and measure students' progress (as well as are used in some of the school sites by CT's to evaluate and measure their own progress), because they represented aspects of classroom practices consistent with those STEP intends to help its students develop. For example, for the first element of the STEP vision "Concern for student learning," I identified a set of eight sub-categories (see Appendix A. for a list of all five categories and sub-categories for analysis)[1]:

- Plan instruction and teach in a way that draws upon and values students' backgrounds, prior knowledge and interests (CSTP standard 1);
- Attention to students' multiple intelligences;
- Use of open-ended questions;
- Use of alternative and varied forms of assessment;
- Clear expectations that demonstrate a focus upon understanding and learning;
- Pushing students to think beyond the immediate discussion; pushing students' thinking; and
- Teaching concepts and skills in ways that encourage students to apply them in meaningful contexts that make subject matter meaningful (CSTP standard 1).

Using these six categories and sub-categories of data, I analyzed the interviews, classroom observation fieldnotes, artifacts and student work for evidence in these categories. Making generalizations about teaching from one classroom visit raises a series of questions about the validity of one's conclusions as teachers use a variety of instructional strategies—such as open-ended questions, or lecture—for different purposes, with different students and at different instructional points in teaching (Shavelson, 1975). Reviewing unit plans helps widen the degree to which I can make some claims about the character of practice and curricular vision. However, they do not always provide evidence of every strategy either. Therefore, after reviewing the evidence from fieldnotes, artifacts and interviews, I rated all ten graduates on a continuum of "Strong Evidence"; "Some Evidence" and "Little Evidence" for each sub-category. Describing the degree of evidence allows me to suggest some of the limits of my data collection, as opposed to making statements and claims about a teachers' practice.[2]

Findings: What Characterizes STEP Graduates' Practices?

What is the nature of STEP graduates' teaching practice? What elements of the STEP vision can be traced into STEP graduates' classroom teaching and practice? Using the five elements of the STEP vision as a framework, I now describe the number of graduates for whom I found strong evidence of these elements STEP vision, and share some instances that demonstrate the range of ways in which STEP graduates instantiated those elements in their practice. I also share the numbers of graduates who exhibited fewer of these teaching dimensions. Finally, I link the things teachers say they learned to particular aspects and courses in STEP, based upon a review of the syllabi from the program.

Concern for Student Learning

Sub-Category	Strong Evidence	Some Evidence	Little Evidence
Plan instruction and teach in a way that draws upon and values students' backgrounds, prior knowledge and interests (CS standard 1)	10	--	--
Teaching concepts and skills in ways that encourage students to apply them in meaningful contexts that make subject matter meaningful (CS standard 1)	10	--	--
Active engagement in problem-solving and critical thinking	9	--	1
Clear expectations that demonstrate a focus upon understanding and learning	9	--	1
Evidence of pushing students to think beyond/pushing students' thinking	6	3	1
Use of alternative and varied forms of assessment	6	2	2
Attention to students' multiple intelligences	4	4	2
Use of open-ended questions	4	3	3

As a group, I found strong evidence for many STEP teachers in terms of their attention to student learning in their practice. Of the ten graduates we observed thus far as part of this study, for instance, six graduates demonstrated strong evidence in nearly every category but two. Only

one graduate demonstrated strong evidence in just one of them. For instance, across the board, STEP graduates demonstrated in observations that they built upon and valued students' backgrounds, prior knowledge and interests in their teaching. STEP teachers frequently started lessons by asking students to write about their own ideas about and experiences with the topic in order to provide students with some time to clarify their thoughts and to draw upon what they know already about a topic. Activating students' prior knowledge is a very important move in good teaching (Bransford, Brown & Cocking, 2002). STEP graduates asked students to draw upon their own lives and experiences before evaluating the experiences of another. In two units I gathered from two teachers, which both happened to be designed around Elie Wiesel's Night, the two teachers (one a Social Studies teacher; another an English teacher, each at different schools) each separately had devised a series of activities around identity—a central theme in the book. One teacher had asked her students to conduct interviews with family members as a way to begin to understand the relationship between personal story and history—at the same time, building upon students' own "funds of knowledge" (Moll, 1991). She also asked students to construct an "identity box" that displayed key artifacts, items and symbols about their own selves, and then later, asked them to do the same for the author, Elie Wiesel. The other teacher asked students, in preparation for talking about how the Holocaust stripped Jews of their identities, to make a quick "identity map" in class that would reveal some of the key important aspects of their own personalities. These strategies are a strong means of helping students make initial connections to their own experiences, which then provide opportunities for them to "transfer" their learning to new situations (Bransford, Brown & Cocking, 2000). STEP graduates often select "entry points" (Wiske, 1997) into topics that are of deep interest to adolescents: Kara, an English teacher observed in this study, asked her students to think about Hamlet's stance on women, leading

them to discussions of what it means to have a self –all issues quite deeply interesting to teenagers around relationships, identity.

Evidence from one of the STEP science teachers' unit plans for her heterogeneous science class showed that in her unit on physiology, she had begun her entire semester with questions about "What do you really need to stay alive?" and beyond food, water and shelter, they discussed the effect supplements have on the body's health. She asked students to then conduct research on a particular supplement (calcium, gingko biloba, kava, and so forth) and to evaluate the negative and positive effects it might have upon one's health. Knowing that her students were often interested in vitamins, body building supplements, and other nutritional enhancements, she chose this as an intriguing and current entry point into their explorations of the body. The role of students' prior knowledge in learning—and the importance of designing instruction that surfaces, connects to, and builds upon students' ideas, needs and interests—is a central idea addressed in the Principles of Learning for Teaching class in STEP, as well as in the Curriculum and Instruction (C&I) classes in STEP.

Another area in which STEP graduates were particularly strong was in the category of teaching concepts and skills in ways that encourage students to apply them in meaningful contexts that make subject matter meaningful. STEP teachers achieved this in a variety of ways: Julie's activity of making a model of the ear had developed out of students' growing interest in the unit on sound and sound waves in "how we hear." On the day I observed, an activity of modeling the ear prompted the students to raise a set of interesting questions about how one's ears get damaged; why water gets in one's ear and where it goes and how far it goes. As another example, Jim had developed a project that encouraged students to apply the concepts of G force and derivatives in a real-life situation of a flight plan (students had to use derivatives to

demonstrate what sorts of maneuvers a female pilot had made, from reading a flight data chart). Students became so interested in some of the fine and subtle details of this project, asking questions about how low the pilot flew during an airshow; how the blood might move in one's head during a flight, that Jim had to make some adjustments because students were taking more "real-world" factors into account that in fact were making the project more complicated and harder for them to solve (though they all were able to be quite successful in ultimately determining the derivatives). This idea of making subject matter meaningful is a central idea explored in STEP's Curriculum and Instruction courses, and is also emphasized in the Principles of Learning for Teaching class when students explore questions about authentic learning and how to support it.

As another example, though some used them more than others, seven of the graduates observed used open-ended questions at key points in their lessons. For instance, Kara, when engaging her students in a group discussion about Hamlet's sanity and his beliefs about women, employed open-ended questions like "What do you think?"; "What do you mean?"; "Is he mad?" with extremely high frequency. Students' responses demonstrated depth and substance—as when one student said "I think he's logical in what he shares with those around him. But at the same time, he cannot let the outside world in. He comes to act like he's mad—even if he's mad or not—perhaps because that's less of a punishment on him from the government if he kills his father." This provided some indications that in Kara's classroom, students had learned that open-ended questions were not mechanical questions—they demanded thoughtful, rich answers—and that students had learned to push their own thinking to provide them.

So for instance, when Julie, an eighth grade science teacher introduced her students to the activity she had planned of making a model of an ear, she started off the discussion by asking "When we build a model, is it exactly like an ear? How is it different?" When Juanita asked her ninth graders to review the murals their classmates had made about the factors that can lead to success in school (as part of a unit on Diego Rivera), she did not comment on themes she noticed but rather asked them to generate patterns themselves: "What do you notice about all these murals?"; and asking questions that pushed their thinking such as, "Do you agree with that? *Do* sports keep you out of trouble?"

While circulating around in groups can sometimes be used as an opportunity for teachers to provide "answers" to struggling groups, the STEP teachers I observed who managed groups often used those moments to ask questions of the group. This indicated again STEP graduates' abilities to push student thinking, to signify their commitment to students' taking ownership of their own learning—to support students in thinking on their own. So for instance when Julie circulated among her groups of an eighth grade science students building a model of the ear, she could be heard not providing answers but rather asking her students questions like: "What's the purpose of attaching the pen to the cork?"; "What does the tape represent?"; "How does sound travel through the model?"; and "What function does the ear have in real life?" that served to focus their attention to key aspects of the problem, but also indicated that they still had thinking to do. Students in Julie's classroom did not seem to be looking answers—and seemed accustomed to Julie's questions, and they would turn back to their work and to talking to one another. I never saw an instance in which her students asked her to "just tell us the answer" or in which students seemed upset, befuddled or unprepared to move forward after she asked a question, rather they seemed prepared and fairly confident in their continued discussions of their

observations and model. As another example, Jim, a math teacher teaching seniors, engaged his students in groupwork to derive the flight pattern from a data strip, would circulate and ask questions like, "What do you think? What does G represent, anyway?"; "What do you measure gravity in?" At the same time, variation did occur. Three of the ten graduates who engaged their students in discussion (often a good forum for using open-ended questions) did not ask as many open-ended questions as other graduates.

One area where STEP graduates were also strong as a group was in pushing students' thinking. I looked for evidence of this skill both in their classroom practice as well as in their student work. Six graduates demonstrated strong evidence of their ability to do so in their classroom practice; we had some evidence from three graduates, and little evidence for just one graduate. Interestingly, several of the teachers who did not demonstrate much evidence of pushing students thinking in discussion demonstrated their ability to push student thinking in other arenas—such as when responding to student work, writing, or projects. Indeed, one of the graduates that I observed missing some opportunities to push student thinking in a discussion was extremely strong in responding to students' ideas as expressed in their writing and pushing students to elaborate and expand—making comments that not only talked about the strengths of a piece of writing "I would have liked to have known more about [a particular topic]" or "I would have liked to know more about your friend's response to your decision. What were the interactions like? How did you feel then?" On another piece of student writing about the Lord of the Flies that needed more support, she wrote comments like, "Good connection, but it is a big jump that needs explanation": and "Calling them savages simplifies what could be a very complex and interesting commentary. Why do they choose these actions over others and what long-term consequences will this lead to?"

Finally, while six STEP graduates demonstrated strong evidence of the use of a variety of assessments—their unit plans included a range of assessments from group quizzes, individual assessments, performance assessments, and all used rubrics with clear criteria to assess their students' work, an examination of these tools from their unit plans and materials revealed some variation in their character and execution. One ELD teacher's unit plans provides an example of somewhat inconsistent assessment design: she had used very thoughtful and detailed rubrics to assess an interpretive essay that had each cell carefully filled in, with clear requirements around structure, style, use of evidence from the text and overall effect, and very appropriate language for students that suggested that their work was in development. Yet for another essay—a personal reflection, in fact—she had chosen a rubric that had the categories of "Below Grade Level" "At Grade Level" and "Above Grade Level." STEP teachers themselves felt less comfortable with their assessment skills. In interviews, STEP teachers consistently identified assessment as the area in which they felt the least confident. Many pointed out that though they used rubrics, they had concerns about how well-designed they were and whether they were as useful for students as they wished. Their concerns make sense given the fact that until the 2001-2002 school year, STEP did not offer a course on assessment and STEP faculty acknowledged that the concept of assessment was not as deeply addressed as they would like (Hammerness & Darling-Hammond, in press).

Content Pedagogical Strategies

Category	Strong Evidence	Some Evidence	Little Evidence
Designing units and lessons around issues that are central to the discipline (i.e. essential questions & thinking about the structure of a discipline)	10	--	--
Selection of powerful and generative materials	9	---	1
Engaging students in the modes of inquiry of the	7	3	---

discipline			
Critical thinking within the discipline	7	2	1

Another element of the STEP vision that many STEP teachers demonstrated frequently in their classrooms and unit plans was the use of content pedagogical strategies. Half of the STEP graduates demonstrated strong evidence in every category; seven demonstrated strong evidence in three of four categories and nine in two of four categories. Two areas in which STEP teachers demonstrated the most evidence were in designing units and lessons around issues that are central to the discipline (i.e. essential questions, or identifying key ideas that were central to their discipline) and the selection of powerful and generative materials. Nine STEP teachers provided strong evidence for both these categories. Many STEP teachers had identified "essential questions" or big issues that their units focused upon. For instance, a review of Lindsey's Night unit designed for her ELD students revealed that she had focused upon the essential question of "What is the relationship between our stories and our identity?" and "How is each of us a 'witness of history' and a 'messenger to humanity'?" Lindsey had selected some extremely powerful materials to supplement her unit: materials selected from the "Facing History" project such as a videotape of an interview with Elie Wiesel conducted by high school students (she felt that this film would be particularly powerful for high school students as an audience); and a film of Holocaust survivors by Steven Spielberg; as well as a written interview with one of the concentration camp commandants. All these materials were extremely rich and enabled students to gain multiple perspectives upon the experience Wiesel describes in Night. The eighth-grade science teacher had designed an entire unit on sound waves, focusing upon the central question "How do we hear?" and had engaged the students in constructing models of the ear; drawing an "earbook" that required students to create their own representation of the ear. Because students became quite interested in echoes, this teacher had revised her curriculum to add a few days of

exploration of echoes and how the human ear experiences them. The concept of the "essential question" and of designing curriculum around generative topics of deep importance in one's discipline—as well as that provide intriguing entry points to teenagers—is an idea that all STEP students engage with when they read Wiggins and McTighe's (1998) Understanding By Design, a core text in all STEP Curriculum and Instruction classes.

While not directly using an essential question as his focus, one of the math teachers I observed had developed an entire unit around derivatives in such a way that the content came alive and was quite connected to the real world. He noted that "little justification is necessary for a unit emphasizing derivatives, because derivatives are at the very core of calculus… mastery of the key concepts is essential to comprehending the Fundamental Theorum, and thus, to comprehending integral calculus fully" (unit plan outline, 2000). Despite a rather dry rationale, Jim selected a captivating video of a female stunt pilot to begin the project I observed, and he gave each of the eight working groups in his class a different model plane to use to try to determine the flight maneuvers Patty Flagstaff might have taken.

Many STEP teachers were also strong in engaging students in the modes of inquiry of the discipline. For instance, a review of Sue's curriculum materials for her physiology course designed for her heterogeneous class, revealed a clear focus upon the process of scientific inquiry. For instance, her "lab report form" (which students use several times a month) emphasized hypothesizing, experimental design, data, results and conclusions, but she had framed each of these elements in terms that her students would relate to. For instance, her form describes an hypothesis as "an educated guess to the problem that can be tested. Here you give your educated opinion on what you think the rest of the experiment will be. The hypothesis can be written in one of two ways: *If(the test)...then (your opinion)...because (why you think you will*

see your predicted results) or *I think...because.*" For the "results" section, she writes, "In this section, 'give words' to your data. This section is written in paragraph form and it should highlight the significant results seen in the data section." In describing the conclusions, she not only instructs students to provide "a summary of what you expected to happen" but also to "Reflect on the overall meaning of the lab. What was learned from it that can be related to the outside world?" and to "Relate your concluding thoughts to the big concepts you discussed in the introduction." She even suggests that they "comment on the lab—was it a good model to use for what was being tested?"

Strong evidence also existed for STEP teachers' ability to help students think critically within their discipline. Many STEP teachers like Sue, in the previous example, pushed students not only to use the modes of inquiry in the discipline but also asked students to connect what they learned to the "real world." Sue's request that students critique the selection of the lab itself, was another example of that type of critical thinking that I saw demonstrated in STEP teachers' classrooms and unit plans. As another example, in Lindsey's unit on Night for her ELD students, Lindsey consistently engaged students in critical thinking. For instance, after watching the Spielberg video portraying survivors of the Holocaust, Lindsey engaged students in the question of "Why do you think these survivors have chosen to tell their stories to the world? What do they expect you and others to learn from such stories?" At least three times throughout the unit, she asks students to think about "why" Elie Wiesel wrote the story, and what they think he wanted readers to learn from it. Towards the end of the unit, she asked students to consider: "Is there hope in Wiesel's story?" Daniel, in his heterogenous math class, consistently asked his students to explain *how* they came up with particular mathematical solutions, and emphasized over and over in his work that he pushed students to explain the process of their thinking, not

simply what they came up with.

Commitment to Equity

Category	Strong Evidence	Some Evidence	Little Evidence
Curriculum is designed to address different learning styles	9	1	--
Equitable working structures for students	7	2	1
Knowledge is viewed critically (GLB)	7	3	--
Development of curriculum that addresses issues of equity or social ills	7	3	1
Encouraging all students to participate in making decisions and working collaboratively	5	4	1
Creation of tasks that are complex and require groupwork	5	4	1
Teachers are cognizant of themselves as political beings (GLB)	2	1	7
Students' real-life experiences are legitimized as they become part of the "official" curriculum (GLB)	1	3	5

While a number of STEP graduates demonstrated strong evidence of commitment to equity, I did not find quite as much evidence of this element of the STEP vision as I did of a focus upon student learning and of content pedagogical strategies. However, the evidence was still fairly strong. Of the ten students observed, seven graduates demonstrated strong evidence in half of categories. Five graduates demonstrated strong evidence in more than half of the categories. One area in which STEP graduates demonstrated much evidence was in developing curriculum that addressed different learning styles. STEP teachers were clearly deliberate about including activities that were designed for visual learners, or auditory learners, or kinesthetic learners. In particular, they demonstrated strong evidence particularly around introducing new ideas using a variety of modalities: visuals, oral descriptions, demonstrations, and/or hands-on activities. For example, in Janita's Spanish for Native Speakers class, although she had students working in groups for much of the time of the class, she also included group presentations, demonstrations of vocabulary concepts that drew upon student volunteers, pair-share activities that included

writing and speaking, and individual speaking and listening activities.

STEP teachers were also quite strong in developing curriculum content that addressed issues of equity in society, or that in some way acknowledged societal equity issues such as racism, discrimination, prejudice or inequality. Seven of the ten observed demonstrated evidence for this category. For instance, the day I observed, Paula was asking her students in groups to critically examine the political strategies certain marginalized groups (such as disabled citizens' groups, African-Americans, Chicanos, and Asian-Americans and Lesbian and Gay Rights groups) had utilized to gain power and to achieve their own ends in the 1960's. The English and Social Studies classrooms that I observed that were both reading Night were focusing upon questions about how to prevent the Holocaust from happening again.

It is worth emphasizing that these STEP teachers were providing *positive* examples of equity for their students, in other words, STEP graduates seemed to not simply teach their students about inequality, but they devised curriculum that suggested ways in which students could take some action, could study some positive examples of change, or could examine instances of good action in the world. For instance, Janita had developed a project for her Spanish Native Speakers class and for her Spanish I class in which they learned about the murals of Diego Rivera (she felt it was important for her students to learn about their own heritage and artists from their own background), and then for a final project, asked the students to design murals that would inspire their own classmates to be displayed around the school. She required the murals to address the topics of how to sustain kids' success in schooling. Brenda, the high school social studies teacher, had co-designed a project that student worked on simultaneously with their unit on Night in which her students were to investigate "Peacemakers"—they were to write a biography of a Nobel Peace Prize Winner. Even in the math classroom I observed, the math teacher had

carefully chosen his project (in which students analyzed a flight data strip to determine the flight maneuvers the pilot had made) to feature a female stunt pilot. This female pilot, Patty Flagstaff, not only starred in the short video clip about stunt flying that Jim showed early on in class (that illuminated her strength, bravery, and intelligence), but Jim also created the project so that the flight data strip was ostensibly taken from one of her flying demonstrations in an airshow in which she participated. Jim explained after class that this careful choice was a direct result of what he had learned in STEP—that his decision to feature a female pilot would never have crossed his mind, but now he understood the importance of such a choice for his female math students.

Another area in which STEP graduates seemed to demonstrate significant evidence was in creating equitable working structures. Seven of the ten students were rated as high in this category. When observing the STEP graduates, seven of them had students working productively in groups nearly the entire class –and for all these teachers, this was for a block period of nearly ninety minutes. A number of STEP graduates also demonstrated evidence that they could design tasks that required groupwork—complex tasks that were not easily resolved by one person and that thus, prompted students to work with one another in meaningful ways. Five STEP graduates demonstrated strong evidence in this sub-category.

Evidence demonstrating that STEP graduates "encourage all students to participate in making decisions and in working independently and collaboratively" was more mixed: five STEP teachers demonstrated strong evidence in this category, four demonstrated some evidence and one did not demonstrate much evidence of this ability. Those STEP graduates demonstrated strong evidence in this category achieved this in a variety of ways. For instance, in the eighth grade science class I observed, the class was very formally constructed for groupwork—every

child had a "role" from facilitator, to recorder, to "harmonizer." Children took their roles seriously and acted in ways consistent with their responsibilities: students asking one another for evidence as facilitators, recording diagrams if a recorder. While they were in groups for over an hour together constructing a model of the ear, students rarely called upon Julie (the teacher) for assistance, and if they did, she would often urge students to help one another rather than provide an answer herself—or remind students of their roles. Such reminders did not seem to frustrate students or stump them; they would turn back to their discussions and work without seeming confused or troubled. And in an English class that I observed, I watched a group of three students in which two more vocal students were asking their quieter groupmate, "What do you think?" in such a way that indicated their interest in what he thought: he shared his opinion in some depth—these students wanted to be sure that their classmates were included and were heard. The importance of assigning roles and responsibilities to students—and in helping students become more responsible for their own learning, which Rachel Lotan calls "delegating authority"—is a central idea that she addresses in her course "Teaching and Learning in Heterogeneous Classrooms" in STEP.

While some might argue that this could be construed as an area in which STEP teachers were less successful, this may be an area in which few novice teachers would do well at all. Delegating authority to students in a meaningful way is a task that teachers find extremely challenging; the fact that a portion of STEP teachers and their students were able to accomplish this in extremely sophisticated ways is significant. It is also worth mentioning that two of the particularly powerful examples I first described of this work occurred in a significantly contrasting settings: one, in an affluent school in a mathematics classroom AP class, and the eighth grade science classroom in a low-income community school. The fact that in both

environments one might see students generating evidence, theories, suppositions in such dramatically different settings is encouraging. Furthermore, two other quite powerful examples also occurred in two low-income school settings—another in a mathematics classroom and one in a Spanish for Native Speakers classroom. The high degree to which these students demonstrated their ability to work intellectually, independently and collaboratively, while in difficult school settings seems a particularly significant—and hopeful—finding.

Capacity to Reflect

Category	Strong Evidence	Some Evidence	Little Evidence
Reflects upon and analyzes teaching with an eye to improvement	5	1	3
Seeking out learning experiences to improve teaching (i.e. attending professional conferences, etc.)	5	--	5
References to theory and ideas from STEP	2	3	4

Perhaps because it is harder to obtain evidence in this category from observations and unit plans, less evidence was available for STEP graduates' capacity to reflect. Half of the STEP graduates observed, when asked why a unit or lesson had been altered or changed, described thinking carefully about what students had and hadn't learned in this unit, and how they imagined teaching it again differently in such a way that students might learn better. One of the science teachers in this study, Sue, explained that she designed curriculum with a colleague from STEP who had graduated the same year she had. The two of them plan all their curriculum together, adapting, revising and discussing what they should do with their students. Sue noted that they had completely revised their physiology units from last year because she felt that they organization of it was not quite as intuitive nor quite as sequential in terms of scientific concepts as it could be; so she and her colleague re-framed the course to be shaped around questions like,

"What holds the body together?" "What does the body need?" and "How does our body move?" She also noted that she had grown concerned that her students were using the Internet frequently as a resource for their research, but that they were not particularly aware of how to distinguish between a good source and a questionable one. She has initiated a research group of her colleagues in her science department that meets once a week to study how their students used the internet, and to come up with ways to help them become critical reviewers of such material.

Similarly, Lindsey, the ELD teacher observed in this study, explained that she plans all of her units with a team of English and ELD colleagues. She said that while they often brainstorm and develop activities and assignments, she often finds that she goes home and adapts them to meet the needs of her students. For instance, when she and her team of colleagues planned the Night unit, she decided that one of the activities that a colleague had suggested as a culminating activity (it involved interviewing a parent or grandparent about a story from their own history) was not rigorous enough for a final project nor would it push her students to go deeper—and that it might be more suited as what Lindsey termed an "into" activity (an introductory activity for her students that would hook their interest and introduce them to some key ideas in the unit). As another example, on the day I observed her, Lindsey had adapted some of the Facing History materials to include some more "open-ended" thought questions—she felt that the questions closed off a certain amount of reflection that students might wish to engage. To be a novice teacher and have the confidence to rethink the suggestion of a more experienced partner, and to adapt the curriculum of a well-respected curriculum program, seems particularly strong evidence of this young teachers' capacity to reflect.

As a final example, Janita, a Spanish teacher, explained that she kept a daily reflective journal, in which she reflected upon all manner of elements of her teaching. Though she felt it

was too personal to share with me as data, she explained that the journal addressed issues such as how students responded to particular aspects of her lesson, how she felt about how activities had been experienced by her students, and her broader aims and goals for her students' learning and development. However, this type of formal reflection on their practice was something most STEP graduates reported that they rarely had time to engage in. Many noted, as Julie did, that they felt they reflected all the time, but that they had little chance for formal reflection. She said, "I would like to have more time to write it down because I think when I do it, I do it all the time—but it could be walking to get a drink of water down the hall or grading a test thinking, gosh, why is everyone putting this as the answer? I would like to make some time to actually record it." Many STEP graduates noted that they did reflection on the fly—Brenda noted that "I've certainly been thinking about the things that went well and the things that didn't go so well this year" and explained that she puts "sticky notes" on her unit plans, but that she did not do as much "formal written reflection" as she wished she could. Reflection is a cornerstone in the STEP curriculum, and opportunities to reflect are embedded throughout the curriculum ranging from the use of journals and logs in the literacy course, to logs about students in the Adolescent Development course, to reflections on being observed by their supervisors assigned in practicum, to a final reflection on their learning in STEP that is required for their final portfolio.

A smaller number of STEP teachers—just half of the teachers observed and interviewed—demonstrated evidence that they sought out opportunities to attend conferences and experiences so that he or she could continue to grow as a teacher. Of those who did, STEP teachers attended Facing History conferences, conferences on assessment, conferences on equity in the classroom. For instance, although Janita teaches in one of the most low-income settings represented in this study, she managed to seek out a number of experiences in which to learn and

grow as a teacher. She explained that her unit on Diego Rivera and Frieda Kahlo was inspired by a conference she had just attended a few months before on art and language teaching. She noted that every year, she has attended the California Second Language Learning (CLT) conference. Finally, she had just completed a course on teacher research, which focused upon gathering data and analyzing the experiences of at-risk students.

Commitment to Change

Sub-Category	Strong Evidence	Some Evidence	Little Evidence
Working with colleagues	4	2	4
Appreciation for how school context can shape learning	4	2	4
Evidence of Leadership in School site	2	2	6
Reflecting upon what is and isn't working at school for student learning	3	4	3

While working with colleagues is a strong focus of the STEP program (opportunities for collaborative groupwork and group projects are spread throughout the STEP curriculum and every STEP course involves some elements of groupwork), fewer STEP graduates demonstrated evidence that they continued to work with colleagues after STEP. Four STEP teachers were in school situations in which they planned daily or weekly with colleagues, and two other STEP teachers planned occasionally with colleagues. Four STEP teachers said they had fewer opportunities to work with colleagues; and one math teacher said he rarely had a chance to interact with colleagues about teaching in substantive ways. While some research suggests that the context of the school shapes one's ability to work with colleagues (e.g. McLaughlin & Talbert, 1993), one might also suggest that STEP teachers themselves should be learning in STEP to seek out schools where they would have more opportunities to collaborate. Yet at least four of these STEP teachers had not been able to accomplish that yet.

Several STEP teachers had taken on some prominent leadership positions within their school: for instance, one English/ELD teacher was the Coordinator of the ELD program in her second year of teaching. While one might suggest that this may simply mean that her school did what many schools do—give young, inexperienced teachers the most challenging and least popular jobs—Lindsey was not only smoothly coordinating the ELD program but she had also begun two different programs for her ELD students—a tutoring program that met twice weekly, and that paired ELD students with student tutors, and what she had called a SIBS program, that was also designed to pair ELD students with mainstreamed students. It is worth noting that one of the reasons that Lindsey had come up with the SIBS program was that she had been concerned that her ELD students were not only marginalized by taking a different set of classes, but that they were therefore less able to get access to other aspects of the school (social events, friends, sports, clubs and so forth) because they had so little contact with mainstreamed students. She came up with the idea that she could pair her ELD students with mainstreamed students in such a way that the mainstreamed students would have something to learn from the ELD students (i.e. get tutored in the ELD students' first language, or learn about another country), and that the ELD students could learn from the mainstreamed students—she wanted the students to be in equitable relationships.

While fewer STEP students demonstrated their ability to reflect upon how the school context shaped learning, the two that did demonstrated this in sophisticated ways. For instance, when I visited, Jim commented several times about the "mixed block" schedule his school had recently adopted, feeling that it was not only difficult for students to keep straight as well as that different lengths of time enabled or allowed for certain kinds of teaching. He noted wryly that he had been one of only two faculty members that had voted against the hybrid schedule when it was brought

for a faculty vote. Such a decision can make a new faculty member unpopular, but Jim felt strongly that adopting this mixed schedule would be difficult for students and teachers and he was willing to take a stand.

Lindsey noted when we visited her that she felt that her ELD students were separated out—socially as well as intellectually—from the rest of the students. She noted that she often sees kids from ELD alone, looking as if they don't know anyone. She worried not only about their loneliness, but also that they were missing out key opportunities to *learn* from mainstreamed students; and during our interview she generated a series of ideas about how to connect her ELD students with the mainstreamed kids (and, most powerful to note is that her criteria were that the ELD kids have opportunities to learn from the mainstreamed kids and vice versa). Indeed, by the next time we talked –just two months later, Lindsey had developed with her mainstreamed students, the "SIBS" program that she had designed to bring ELD students and mainstreamed children together. This capacity to "think about the big picture" of teaching and learning—of thinking about school culture and its impact on student learning—is a key idea addressed throughout STEP, but it is particularly addressed in the School Reform courses offered as electives in the Spring quarter (which both Jim and Lindsey took).

Discussion

This analysis suggests that one can trace elements of the STEP vision—concern for student learning; commitment to equity; content pedagogical strategies; capacity to reflect; and commitment to change and reform—not only into STEP teachers' opportunities to learn but also through to STEP graduates' practices. The data also suggest that this finding is consistent across subject matters, suggesting that there was strong evidence of many elements of the STEP vision,

and some consistent kinds of practices, in all STEP graduates' classrooms. This suggests that despite the fact that students took some different courses in STEP (their own particular subject-matter Curriculum & Instruction courses) students encountered and worked through similar messages, questions, and ideas about teaching and learning.

Some elements of the STEP vision, however, were easier to find strong evidence for than others. In particular, evidence of concern for student learning, of use of content pedagogical strategies—strong evidence for these aspects of the STEP vision were readily apparent and frequent in STEP teachers' classrooms. While STEP teachers' classrooms and unit plans demonstrated a real range in the ways that they carried a concern for student learning and the use of content pedagogical strategies into their practice, STEP teachers clearly demonstrated strong evidence of these aspects of teaching and learning. Attention to student learning is a generative topic that STEP faculty seem to have been able to infuse throughout the STEP curriculum, in the C&I courses, in Adolescent Development, in the summer Literacy courses, in Principles of Learning for Teaching, and in Practicum, so it makes sense that these elements seem to have been translated into STEP teachers' practices. The use and nature of content pedagogical strategies is treated extensively and deeply in the two-quarter C&I the 1999 students took, as well as in the increased three-quarter C&I offered for the class of 2000 and presently. The concept of content pedagogical strategies also receives extensive treatment in other core courses, particularly in Practicum and in Principles of Learning for Teaching. Survey results provide additional confirmation for this finding; Eiler and Marcus (in press) found that STEP graduates felt particularly prepared in terms of content pedagogy.

Strong evidence, though not quite so unambiguously strong, also exists of commitment to equity in STEP graduates' classrooms as well. Equity is a concept reflected throughout STEP;

not only in the schools and classrooms STEP selects to "partner" with for PDS-type relationships and for student field experiences but also in the demographics of the students themselves attending STEP. Equity is treated in every STEP course in key readings such as those by Ladson-Billings, Delpit and by reading cases about culturally-relevant teaching. STEP faculty have made a conscious choice not to offer a separate course on race and culture, arguing that it is most important to treat these issues in every class because issues of race and culture are at play at all times in classrooms. In addition, Rachel Lotan's course on Teaching in Heterogeneous Classrooms focuses upon ways to address issues of status, race and culture through designing groupwork experiences for students.

One might argue, however, that an emphasis upon the capacity to reflect; and commitment to change and reform is treated thoroughly in the STEP curriculum, as well. Thus, the finding that students are not demonstrating as much evidence of this capacity is surprising. In terms of reflection, STEP students have multiple opportunities for formal reflection on their teaching in nearly every course in journals, logs, and in formal "reflections on observations" after particular key visits from STEP supervisors. STEP students also reflect through major projects such as the Adolescent case study (see Roeser, in press, for a discussion of this project), the curriculum case study (see Hammerness, Darling-Hammond and Shulman, in press, for a discussion of this project) and their final teaching portfolio. However, though reflection is treated throughout, perhaps the role of reflection may need even more explicit treatment in the STEP curriculum—in terms of what role it plays in one's professional thinking, the importance it has in professional growth. More exploration of the capacity of STEP graduates to reflect on their teaching may be necessary to fully understand this initial finding.

One can argue that commitment to change and reform is also a central focus of the STEP curriculum—from the very first day of Orientation at STEP, teachers are introduced to the notion of teacher as "change agent," and throughout the program, particularly in Practicum, teachers read and learn about reforming schools and alternative classroom practices. These ideas are embedded within the program. However, the finding that fewer STEP graduates have taken leadership roles in this sample is consistent with findings from the survey that graduates feel less prepared in assuming leadership roles (Eisler and Marcus, in press). However, it is important to note that during the academic year 1998-1999, there was no class offered on School Reform (Linda Darling-Hammond taught a class on Small Schools the following year, though it was offered as an elective). So perhaps for those 1999 graduates, and even for the 2000 graduates, issues of change and reform were less salient than they are for current STEP students—though even now, issues of change and reform are treated most thoroughly in a course that is still an elective. In addition, STEP teachers have only gradually been placed in PDS-type schools—though currently STEP teachers' placements are concentrated in PDS-type schools this has taken some time to develop. During the 1998-1999 year, STEP teachers were placed in approximately thirty-five schools and a broader range of practices of teaching and learning may have characterized those placements. Since then, STEP has endeavored to place all of its students in a smaller number of schools that most clearly reflect elements of the STEP vision and of good teaching (this 2001-2002 schoolyear, STEP has placed all sixty students in about fifteen local schools). Thus, STEP graduates in this study may have had fewer clinical experiences in reforming schools.

In sum, STEP graduates seem to demonstrate strong evidence for aspects of teaching that are treated extensively in the STEP curriculum. And, where less evidence is demonstrated—

particularly with regards to change and reform, and assessment—STEP curriculum may not have been as strong during the 1998-1999 and 1999-2000 years.

Implications

> I felt so prepared going into September. Well, actually I was pretty nervous in September, [but by] October I think I realized I was prepared. I knew I had to constantly be thinking about the bigger picture for my students and what goals are there...and I don't think I would have thought about that without STEP. I would have just gone day to day to day and then wherever I was in June—that's just where I was. –Julie, STEP '99

> I'm really, really, really really, glad that I did not just wing it in teaching by myself. I feel like it set me head five years of where I would have been...Really it's better for everybody; it's better for my students, better for me that I didn't have to go through [difficult years without training] because I'm a much more effective teacher for my students ... [So] you can wing teaching...however, the quality of teaching is like night and day between somebody who is well-trained and has experience...and I think that makes a difference for the students, too. What about the students who really want a good teacher, want to learn? –Lindsey, STEP '00

Despite evidence of novice teachers' "reality shock" (Veenman, 1984) and teachers struggling to put the ideas from their teacher education programs into practice (Britzman, 1990) these findings, which are confirmed by other research (Eiler & Marcus, in press), suggest that these teachers are doing well, even in a variety of contexts—from schools in low performing districts, to schools in middle-income districts, to schools in higher socio-economic districts. Particularly striking, however, is not simply that these teachers are not experiencing the intensity of reality shock but that they are also exhibiting practices that are consistent with what they learned in their teacher education program. While some might argue that these graduates might have known these things prior to teacher education (perhaps simply from good preparation in the liberal arts or in their own content area) it's important to note that these teachers were demonstrating evidence of practices that that experienced teachers said they had *not* learned through classroom experience (Kunzman, in press). In addition, in most cases, the areas in which

STEP teachers demonstrated less evidence—for instance, the commitment to change and reform—were also areas that received somewhat less emphasis in the curriculum. Several aspects that STEP teachers themselves identified as being areas of concern and struggle—the ability to design powerful assessments, for example—can also be linked to an aspect of the STEP curriculum that was underdeveloped at the time these teachers were STEP students. Thus, these findings provide some evidence that new teachers *can* learn these complex, deep, diagnostic, reflective, content-based approaches to teaching in teacher education—and demonstrate them in their later professional work.

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Appendix A.

Table of Categories of Analysis and Relevant Data Sources

Category	Data Sources
Concern for student learning • Plan instruction and teach in a way that draws upon and values students' backgrounds, prior knowledge and interests (CS standard 1); • Attention to students' multiple intelligences; • Use of open-ended questions; • Use of alternative and varied forms of assessment; • Clear expectations that demonstrate a focus upon understanding and learning; • Evidence of pushing students to think beyond/pushing students' thinking; • Teaching concepts and skills in ways that encourage students to apply them in meaningful contexts that make subject matter meaningful (CS standard 1) • Active engagement in problem-solving and critical thinking	Classroom observations; unit plans; student work; interviews to supplement
Commitment to equity • Creation of equitable working structures for students • Development of complex tasks for groupwork that require more than one perspective, learning style—that cannot be solved by one person alone • Encourage all students to participate in making decisions and in working independently and collaboratively (CS standard 2.3) • Creation of pedagogy that addresses social issues in the world [note I have to think about how to describe this one, but it's impt as there's so much data on this]	Classroom observations, unit plans; interviews to supplement
Content Knowledge and Content Pedagogical Strategies • Organize curriculum to facilitate students' understanding of the central themes, concepts and skills in the subject area (CS standard 3.2) • Help students learn to think deeply by using the modes of inquiry of the discipline • Use powerful and generative examples, texts, resources and materials in class (i.e. central to the discipline, etc.) • Structure and sequence ideas in the discipline in ways that reflect the disciplinary structure	Classroom observations, unit plans

Capacity to Reflect • Learning from the theory from STEP/references to theory and ideas in STEP • Reflects upon and analyzes teaching with an eye to improvement	Interviews
Commitment to Change and Reform • Evidence of leadership in school communities • Evidence of working with colleagues • Reflecting upon what is and isn't working at their site/in education for student learning • Appreciation for the school context and how that can shape learning • Always trying to learn from theory and practice [i.e. attending professional conferences, meeting with other faculty, getting together with fellow STEP graduates, etc.]	Interviews; unit plans

[1] For the third category, the category of "Commitment to Equity," three sub-categories were borrowed from Gloria Ladson-Billings' (1994, p. 115) list of the tenets of culturally-relevant teaching: Teachers are cognizant of themselves as political beings; Students' real-life experiences are legitimized as they become part of the "official" curriculum; Knowledge is viewed critically.

[2] One important element of this data that I emphasized in my analysis was that the evidence should not simply come from teachers' moves—their talk, discussion, actions, and strategies—but also from students' responses—their talk, discussion, actions and strategies. So for instance, in the category of "open-ended questions" I looked not simply for evidence that the teacher asked open-ended questions but also for evidence that the students were indeed able to respond in thoughtful, deep ways to such questions. As another example, in the category of commitment to equity, I looked not only for evidence that the teacher had provided structures for independent work among and between students (like groupwork) but also for evidence that students really were engaged in intellectual work together. For instance, it's clear that a classroom can be physically arranged for groupwork but that important scaffolding and support needs to be provided from teachers and from the classroom community she develops so that real intellectual work can be accomplished by children, and so that children can begin to see one another as resources. In other words, I felt that the most convincing data from STEP graduates' classrooms came from the *interaction* between students and teacher—which would allow us to make stronger claims about the nature of student learning, of independent work, of disciplinary investigation and of the character of intellectual work in these classrooms.

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